Evans, Diane

From: Michael Pfeil <michael.pfeil@tceq.texas.gov>
Sent: Friday, November 08, 2013 1:31 PM
To: Evans, Diane
Subject: RE: comment on Calabrian report

Diane-

I still think it makes sense to normalize the lab water to the hardness used to derive the criterion, but I don't see any sense in normalizing 100% effluent. It just doesn't make sense to me, especially since the effluent isn't getting the benefit of the DOC found in natural waters. Most of the WER values derive from the hardness of their discharge, though they do have a DOC range of 4 – 14 mg/l. But it's all from their effluent, not the RW.

Mike

From: Evans, Diane [mailto:evans.diane@epa.gov]
Sent: Friday, November 08, 2013 11:38 AM
To: Michael Pfeil
Subject: comment on Calabrian report

Hi Mike,

I think that there is one error in the calculation of the LC50 values in the 100% effluent samples in round #2 (total and dissolved values). However, we end up at pretty close to the same value for a final dissolved WER. Below and attached are what I recalculated

For the nominal concentration of 100 mg/l in 100% effluent, the raw data on adobe page 97 indicates that there were 14 surviving individuals (26 mortalities). This information is correctly recorded on adobe page 34. However, in the statistical analyses on adobe pages 100 (total copper) and 101 (dissolved copper), the mortality was recorded as 24 individuals.

I recalculated using EPA's spreadsheet found at:
http://cfpub.epa.gov/npdes/wqbasedpermitting/wetdocs.cfm#spreadsheet
You likely have easier software to use. This spreadsheet works fine but you have do things in certain order, to be able to see the final results (issue is enabling macros in two different places, first step noted on instructions. Melinda had figured out second step). Also, you can't save each of the calculations, only a summary (and only that if you do in certain order).

Attached is an excel file with the recalculated LC50s for round #2 and the input used for both. The dissolved copper LC50 is 80.4 ug/L and the total copper LC50 is 116.9 ug/L. I was able to match the LC50s (Spearman-Karber) in the original report with this program, when I increased the survival by 2 in the fourth concentration (incl. control). However, every time I copied those tabs to the new file, it re-set my corrected recalculations (didn't spend time trying to un-link the two files). Also, the heading in cell B3 of the input tabs indicates "dissolved" in both, but I did use total concentrations in the second group.

Melinda previously created spreadsheets to for normalization of hardness in WER studies. The spreadsheet also includes the WERs based on SMAVs, which we aren't using for Calabrian. However, I didn't delete that information for fear of affecting the other calculations. The values in the spreadsheet match what the original Calabrian report includes on 26-28 (tab for original round #2 is colored red). I added a second tab for the corrected round #2 values, which is colored green. The WERS based on site water/lab water are in cells E65 and E66 for each of the events.

The next-to- last tab was a test (using round #3) to see if it made a difference by normalizing the lab water results to the hardness of the site water, rather than both lab water and site water to the same hardness of the SMAV. The answer is "no." I inserted the site-water information in place of the SMAV in cells C12-C14. This increases the lab water LC50s, but the WERS (site/lab) are the same as shown for event 3 (previous tab).

The WERs (site/lab) for corrected round #2 are: 2.605 (total copper) and 2.329 (dissolved copper). Using those results with the WERs from round #1 and #3, decreases the final WERs by a very, very small amount. Since the dissolved WER is slightly higher and allows the use of the partition coefficient in Table 6, I'm assuming this WER would be used in TexTox.

round 1	4.248	4.592
round 2	2.605	2.329
round 3	3.013	3.249
final WER	3.22	3.26

EPA doesn't need a revised report for the round #2 correction, assuming TCEQ doesn't either. I'll do more searching on the issue of 100% effluent as site water and will see what Melinda thinks. I did mention it a few minutes ago and she's thinking on it too. Melinda also remembered a WER FAQ that EPA Region 4 (Atlanta) compiled many years ago and she found googling. It looks like this came out in 1992 or 1993, because the 1994 Interim WER guidance is not in references section at the end. Q/A 21 talks addresses the hardness issue and the last sentence of the answer talks about "adjusting" the hardness of the lab water LC50 to the site water LC50.

Once we come to conclusion on your questions, I can send the "approvable" letter any time. Not sure if you want to send this information to Christina to review? Before we do the official CWA approval (following public participation on the proposed permit), we'll need the one page letter requesting approval of the site-specific criteria (don't need for "approvable" letter though).

Thanks for your patience!

Diane